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SIRIUS XM RADIO INC.

IN THE UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

CATCH A WAVE TECHNOLOGIES, INC., a Delaware Corporation,

Plaintiff,

v.

SIRIUS XM RADIO INC., a Delaware Corporation,

Defendant.

Case No.: 3:12-CV-05791-WHA

DEFENDANT SIRIUS XM RADIO INC.'S NOTICE OF MOTION AND MOTION FOR SUMMARY JUDGMENT TO PLAINTIFF CATCH A WAVE TECHNOLOGIES, INC.

Hearing Date: April 3, 2014
Hearing Time: 8:00 a.m.
Courtroom: 8, 19th Floor
Judge: Hon. William H. Alsup

REDACTED VERSION OF DOCUMENT

SOUGHT TO BE SEALED

TABLE OF CONTENTS

TABLE OF AUTHORITIES

Page(s)

CASES

STATUTES

NOTICE OF MOTION AND MOTION

TO ALL PARTIES AND THEIR ATTORNEYS OF RECORD:

NOTICE IS HEREBY GIVEN that on April 3, 2014, at 8:00 a.m., or as soon thereafter as counsel may be heard by the Honorable Judge William H. Alsup, Courtroom 8, 19th Floor, located at 450 Golden Gate Avenue, San Francisco, CA 94102, Defendant Sirius XM Radio Inc. ("Sirius XM") will and hereby does move the Court for an order granting its motion for summary judgment of invalidity. This motion is based on this Notice of Motion, the following Memorandum of Points and Authorities, the Declarations of James Hannah and Donald Cox, the proposed order submitted herewith, the pleadings and papers on file in this action, any evidence and argument presented to the Court at or before the hearing on this motion and all matters of which the Court may take judicial notice.

Sirius XM respectfully requests the Court to grant summary judgment of invalidity. U.S. Patent No. 7,177,608 ("the '608 Patent") is invalid pursuant to 35 U.S.C. § 112 for a lack of written description and the failure to provide a disclosure such that one of ordinary skill in the art can practice the claimed invention without undue experimentation. Additionally, the '608 Patent is invalid as anticipated pursuant to 35 U.S.C. § 102 in view of U.S. Patent No. 6,785,656 ("the '656 Patent"), U.S. Patent No. 6,564,003 ("the '003 Patent"), and U.S. Publication No. 2002/0119760. In the alternative, the '608 Patent is rendered obvious pursuant to 35 U.S.C. § 103 in light of the Fraunhofer '664 Publication in combination with either the '656 Patent or the '003 Patent.

MEMORANDUM OF POINTS AND AUTHORITIES

I. INTRODUCTION

Catch A Wave Technology, Inc.'s ("CAWT's") U.S. Patent No. 7,177,608 (the "'608 Patent") is invalid pursuant to 35 U.S.C. §112 ("Section 112") for a failure to provide a written and enabling disclosure for what CAWT now argues is the claimed subject matter of the '608 Patent, namely the processing of digitally formatted content. It is not surprising that the '608 Patent specification falls woefully short of Section 112's requirements because over 20% of the specification is missing. While it is unclear how over 20% of the specification was omitted from the issued patent, it is certain that CAWT knew of the fatal defect before the '608 Patent issued and chose not to correct it. Unique to this case is that Sirius XM Radio, Inc. ("Sirius XM") can actually point to the missing disclosure in the inventors' possession that they affirmatively choose not to include in the '608 Patent.

[redacted] CAWT eventually abandoned the Continuation Application after several Patent Office ("PTO") invalidity rejections based on the overwhelming prior art covering the processing of digitally formatted content. Now CAWT is trying to contort the '608 Patent claims to cover processing of digitally formatted content. The '608 Patent's defective specification is fatal to CAWT's claims.

The '608 Patent is also invalid pursuant to 35 U.S.C. §§102(b) or 103. Sirius XM began developing the accused technology for processing digitally formatted content more than five years before the '608 Patent Application was filed and thereafter filed several patent applications on its technology. Two of Sirius XM's patents are particularly relevant, as they cover the same technology that CAWT argues the '608 Patent covers. These Sirius XM patents, along with another publication

covering systems used to process digitally formatted content in Europe and Asia, were filed years before the '608 Patent and read on every element of the asserted claims of the '608 Patent as applied by CAWT. Therefore, the asserted claims of the '608 Patent are also invalid due to this prior art of record.

II. STATEMENT OF FACTS

A. The '608 Patent

CAWT filed the '608 Patent Application on March 10, 2003. As can be seen from the issued '608 Patent, it described a radio recorder that allows a user to record AM/FM radio channels for later access. Ex. 1[1] ['608 Patent, Abstract]. The recorder is capable of receiving a wide-band spectrum (*e.g.*, an AM spectrum), consisting of multiple individual channels carrying audio content. *Id*. at col. 2, ll. 45-47. The system is designed to process all of the frequencies within the AM/FM spectrum, and record at least one of them, so that a user can later access the channel for real-time or time shifted listening. *Id*. at col. 2, ll. 38-45.

Claim 1 is an example of the claims at issue in this case:

> 1. *A system for wide-band reception and processing of signals comprising:*
>
> *a signal acquisition stage for receiving a wide-band signal comprised of a plurality of individual channels;*
>
> *a channel extractor for extracting the plurality of individual channels from the wide band signal, coupled to the signal acquisition stage;*
>
> *a file management system for managing the plurality of individual channels, coupled to the channel extractor; and,*
>
> *storage coupled to the file management system, whereby at least one of the plurality of individual channels is stored for later use,*
>
> *wherein the channel extractor further includes:*
>
> *a channel extractor input interface for selecting a plurality of time domain samples from the high-bandwidth digital data stream;*
>
> *a processing block for converting the plurality of time domain samples into a plurality of frequency domain samples, coupled to the channel extractor input interface; and,*

[1] All citations to exhibits (Ex.) are to the exhibits attached to the Declaration of James Hannah ("Hannah Dec.") filed herewith.

> *a channel assembler, for assembling the plurality of frequency domain samples into a plurality of individual channels, coupled to the processing block.*

Id. at col. 20, l. 47 to col. 21, l. 3.

The '608 Patent specification discloses an embodiment of this system as it relates to processing analog signals. In particular, it describes a system which receives wide-band signals comprised of a "plurality of individual channels," consisting of radio frequencies. *Id*. at col. 1, ll. 14-19. The reception and subsequent processing of the wide-band signals, specifically through the signal acquisition stage and channel extractor, applies solely to AM and FM signals and spectrums.[2] The '608 Patent does not, however, disclose a system that can process digitally formatted content, such as satellite and digital signals.[3] In fact, the '608 Patent specification discloses that satellite signals bypass these processes and are fed directly into the file manager, thereby teaching away from the system claimed in the '608 Patent. *Id.* at col. 8, ll. 34-36.

The prosecution history also highlights the exclusion of satellite and digital signals from the disclosure of the '608 Patent. During prosecution, CAWT had to overcome several prior art references disclosing the processing of digitally formatted content, including Multi-Carrier Modulation ("MCM").[4] For example, the PTO issued an invalidity rejection based on U.S. Patent No. 6,785,656, (the "'656 Patent"), owned by XM Satellite Radio, Inc. ("XM Radio"). *See* Ex. 2 [CAWT0000572-86 (5/26/06 Office Action)]. On July 28, 2008, XM Radio merged into and became part of Sirius XM. The '656 Patent not only predates the '608 Patent, but also discloses a portable device which receives and stores digitally formatted content. CAWT only overcame the rejection based on the '656 Patent by amending its claims to include the "***channel extractor***" limitation for processing incoming analog signals. Ex. 2 [CAWT0000593-603 at 595 (8/11/06 Amendment in Response to Office Action)].

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[2] *See, e.g.*, Ex. 1 [CAWT0000345-71 ('608 Patent, col. 3, ll. 34-49; col. 9, ll. 19-32; col. 9, ll. 47-63; col. 11, ll. 17-28; col. 12, ll. 29-47; col. 12, ll. 61 to col. 13, l. 6; col. 16, ll. 39-62; col. 17, ll. 12-25)].

[3] Notably, the only reference to satellite radio in the specification is with respect to an "alternate digital input stage [245]," unaffiliated with the signal processing chain. *See* Ex. 1 ['608 Patent, Fig. 2 at 245].

[4] It is undisputed that MCM is synonymous with OFDM, which is the orthogonal frequency-division multiplexing. Ex. 3 [Deposition of Craig Wadin ("Wadin Depo.") at 119:4-7; Declaration of Dr. Donald Cox ("Cox Decl.") filed herewith, ¶¶ 22, 44, 50.

B. The Truncated '608 Patent Specification

On December 11, 2003, the '608 Patent Application published (the "Published Application") with the specification ending mid-sentence and mid-paragraph. Ex. 4. It appears that the specification was missing 10 pages, which represented over 20% of the 45-page specification. During the nearly four years of prosecution, CAWT made several amendments to the claims and specification, including, most notably, correcting a truncated formula in the specification. Ex. 2 [CAWT0000594 (8/11/06 Amendment)]. [redacted] Ten days after this communication, CAWT paid the issuance fee and submitted a "substitute specification" which introduced, for the first time, 10 pages of text to the end of the specification. These pages completed the last paragraph in the '608 Patent Application and added 26 new paragraphs of text. *Compare* Ex. 2 [CAWT0000666-675 (Substitute Spec. at 39-48)] *with* Ex. 1 [CAWT0000360-369 ('608 Patent)]. They described, for the first time, the processing of both analog *and digital* signals through the channel extractor limitation. Ex. 2 [CAWT0000670 (Substitute Spec. at ¶ 0119)]. They also contained several references to digital radio broadcast providers, such as Sirius XM. *Id.* ("digital audio formats such as HD Radio, XM Radio, Sirius, DAR, DirecTV, Dish Network, and others")). However, the "substitute specification" was defective because it did not comply with the MPEP and was submitted after prosecution closed. It was also never accepted by the PTO.

The "substitute specification" also did not contain the amendment to the truncated formula

made to the specification during prosecution. [redacted] CAWT did nothing to correct the defective specification. On February 13, 2007, the '608 Patent issued with over 20% of its specification omitted and with a specification that only disclosed analog signals for processing through the channel extractor.

C. The Continuation Application

On the same day CAWT submitted the "substitute specification," it filed the Continuation Application. This Continuation Application had the same specification as the '608 Patent, but also included the 10 pages that was in the "substitute specification" described above. Cox Decl., ¶ 16. [redacted]

[redacted]

D. The Prior Art

Notwithstanding the prosecution of the '608 Patent and CAWT's failed attempt to obtain a patent with the Continuation Application covering the processing of digitally formatted content, CAWT's application of the claims to encompass the processing of digitally formatted content invalidates the '608 Patent. In particular, there are three primary prior art references. Sirius XM's U.S. Patent No. 6,785,656 (the "'656 Patent") was cited against the '608 Patent Application for the same disclosure that CAWT now seeks to cover in its infringement proofs. Similarly, as discussed more fully below, Sirius XM's U.S. Patent No. 6,564,003 (the "'003 Patent") also discloses processing of digitally formatted content. Both Sirius XM patents predate the '608 Patent by several years. There is also a foreign prior art patent publication, U.S. Publication No. 2002/0119760 (the "'760 Publication"), that discloses processing of digitally formatted content using the European and Asian standards that employs the same underlying technology accused of infringement.

III. ARGUMENT

A. The '608 Patent Is Invalid Under 35 U.S.C. § 112 for Lack of Written Description.

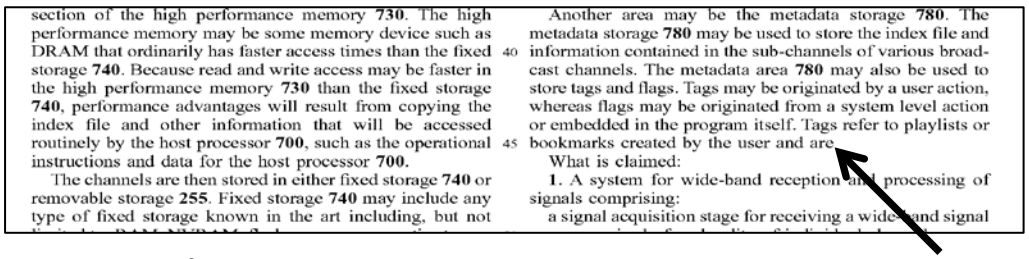
It is undisputed that over 20% of the '608 Patent's specification is missing from the issued patent and that this portion omitted from the specification is the only description of processing digitally formatted content – *i.e.*, the scope of the claims that CAWT is advocating in this case. CAWT attempts to capture the processing of digitally formatted content through its overly broad application of

the "signal acquisition stage" and "channel extractor" limitations. In light of the '608 Patent's limited specification, however, there is no factual dispute that, under CAWT's interpretation of the asserted claims, the '608 Patent does not provide a written description that "clearly allow persons of ordinary skill in the art to recognize that the inventor invented what is claimed." *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (*en banc*) (citing *Vas–Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1562-63 (Fed. Cir. 1991)).

The written description analysis requires an "objective inquiry into the four corners of the specification" from the point of view of a person with ordinary skill in the art, to determine whether the specification supports the full scope of the claimed invention. *Id*. Because the "four corners" of the '608 Patent's specification was so severely truncated, omitting everything that might support CAWT's argument for its proposed scope of the asserted claims, summary judgment on invalidity for failure to meet the written description requirement is appropriate here. No reasonable jury could conclude that the specification of the asserted patent adequately demonstrates that the inventor possessed the full scope of the claimed invention. *See PowerOasis, Inc. v. T–Mobile USA, Inc.*, 522 F.3d 1299, 1307 (Fed. Cir. 2008).

1. The '608 Patent specification is defective.

One need look no further than the four corners of the '608 Patent to conclude that it is defective. The specification ends mid-sentence in the middle of a description of the storage functionality of the invention (as shown by the arrow below):



section of the high performance memory **730**. The high performance memory may be some memory device such as DRAM that ordinarily has faster access times than the fixed storage **740**. Because read and write access may be faster in the high performance memory **730** than the fixed storage **740**, performance advantages will result from copying the index file and other information that will be accessed routinely by the host processor **700**, such as the operational instructions and data for the host processor **700**.

The channels are then stored in either fixed storage **740** or removable storage **255**. Fixed storage **740** may include any type of fixed storage known in the art including, but not

Another area may be the metadata storage **780**. The metadata storage **780** may be used to store the index file and information contained in the sub-channels of various broadcast channels. The metadata area **780** may also be used to store tags and flags. Tags may be originated by a user action, whereas flags may be originated from a system level action or embedded in the program itself. Tags refer to playlists or bookmarks created by the user and are

What is claimed:

1. A system for wide-band reception and processing of signals comprising:

a signal acquisition stage for receiving a wide-band signal

Ex. 1 ['608 Patent, Specification at col. 20, l. 45].

The reasons for this defect are unknown and ultimately immaterial to the written description analysis because "possession as shown in the disclosure" of the asserted patent is the proper standard for written description and "'[p]ossession' or reduction to practice outside of the specification is not

enough." *Ariad.*, 598 F.3d at 1351. While it appears that the written text of the specification was originally 45 pages, only 35 pages are part of the issued patent. Based the four corners of the '608 Patent, the inventors did not provide a written description for processing digitally formatted content.

2. CAWT's broad interpretation of the asserted claims, along with the '608 Patent's defective specification, provide undisputed evidence that the asserted claims are invalid.

CAWT alleges that the asserted claims of the '608 Patent, directed to a radio recorder, broadly encompass an invention capable of processing digitally formatted content. Ex. 16 [Opening Expert Report of Dr. Schuyler Quackenbush on the Infringement of U.S. Patent No. 7,177,608 ("Quackenbush Opening Report") at ¶¶ 76-79 (stating that the XM broadcast signal meets the "wideband signal" comprising a plurality of channels," limitation in the '608 Patent)]. This broad interpretation of the '608 Patent claims must be supported by commensurate disclosures in the specification. *See LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005). The claim scope CAWT is advocating far exceeds the limited disclosures contained in the '608 Patent's specification, which is overwhelmingly directed to analog signal processing and storage, and provides no support for a receiver capable of processing digitally formatted content. No reasonable fact finder could conclude that the limited disclosures of the defective specification provide support for the invention CAWT alleges is claimed in the '608 Patent.

Specifically, the required support for processing digitally formatted content is entirely absent from the '608 Patent's truncated specification. The specification repeatedly refers to AM and FM signal processing, both in the descriptions of the potential embodiments of the invention and in the descriptions of the problem sought to be solved by the invention. It never, however, references digital signal processing. *See, e.g.*, Ex. 1 ['608 Patent, col. 1, ll. 29-36 (pointing out that currently, "a listener can [only] adjust the FM tuner to receive any one of the channels of audio signals for playback at one time. For instance, the listener may adjust his FM tuner to receive [a given frequency]. The FM tuner will then demodulate the base-band audio signal present at 88.1 MHz, and allow the listener to hear the live audio broadcast at that frequency.")]; *see also id.*at col. 12, ll. 29-47.

Moreover, numerous paragraphs of the specification are dedicated to various processing steps

that uniquely pertain to analog signals. *See, e.g.,id.* at col. 3, ll. 34-49; col. 9, 47-63 (describing an embodiment with separate analog signal preconditioners for AM and FM frequencies, and another with separate analog correction blocks for AM and FM frequencies); *see also* col. 12, ll. 29-47 (signal acquisition block for AM and FM bands). There is no explanation of how the invention could receive or process digitally formatted content and specifically no disclosure supporting CAWT's application of the "signal acquisition stage" and "channel extractor" limitations – including, the "channel extractor input interface," the "processing block," and the "channel assembler" – for this purpose. A person of ordinary skill in the art could not be convinced, based on a specification devoid of references to digital transmission or reception, that the inventor possessed an invention capable of processing digitally formatted content. Cox Decl., ¶¶ 10-15.

3. The prosecution of the '608 Patent proves that the specification does not disclose processing digitally formatted content.

If there were any doubt that the '608 Patent specification lacks support for the processing of digitally formatted content, CAWT's failed attempt to improperly submit a "substitute specification" that added 10 pages of text should lay any such doubt to rest. *See* Ex. 2 [CAWT0000624-75 ('608 File History, Substitute Spec. Submittal of 12/12/2006)]. The additional pages, in stark contrast to the '608 Patent specification included multiple references to processing and specifically digitally formatted content references Sirius and XM. *Id.* For example, the '608 Patent discloses bands consisting of either AM or FM content. Ex. 1 ['608 Patent at col. 3, ll. 34-49]. The substitute specification describes "inputs from other digital audio formats such as HD Radio, XM Radio, Sirius, DAR, DirecTV, Dish Network, and others." Ex. 2 [CAWT0000670 ('608 File History, Substitute Spec. at ¶ 0119)]. The Examiner properly disregarded this eleventh hour "substitute specification" and the '608 Patent issued without this text.

[redacted]

[redacted]

In the various office actions rejecting the proposed claims in CAWT's '608 Patent Application, the Examiner cited to XM Radio's '656 Patent, disclosing the system accused of infringement here, as invalidating prior art that CAWT could not overcome. Ex. 2 [CAWT0000572-86 at 75 (5/16/06 Office Action); CAWT0000606-13 at 612 (Notice of Allowance)]. Initially, Mr. Herz amended the claims to require the individual channels to be stored for later use in order to overcome a different prior art reference. *Id.* [CAWT0000553-567 at 54]. The Examiner did not agree and followed with a final rejection, citing the '656 Patent as including "user selected preferred storing of the plurality of information signal from channel CH1 to CHn, in order to provide the flexibility for user to play back later of the received channel information from previously selected stored audio." *Id.* [CAWT0000576 (4/22/06 Office Action)]. In response, Mr. Herz changed the focus of the claims to analog content because the '656 Patent discloses the processing and storage of digitally formatted content. In doing so, he amended all of the independent claims to include a ***channel extractor***. *See id.* [CAWT0000593-603 at 595 (8/11/06 Amendment (cancelling then claims 2 and 3 which were rejected in the5/16/06 Office Action as unpatentable over prior art which, in part, taught a "wide-band analog to digital converter for converting the wide-band signal into a high-bandwidth digital data stream") (CAWT0000577)]. The '608 Patent teaches that this channel extractor element is necessary for processing analog signals, such as AM/FM radio, but cannot be used for processing digital signals, such as satellite radio and television. *Id.*

CAWT's amendment demonstrates that the purported invention of the '608 Patent was only directed toward the processing and storage of non-digital content which applies specifically to the processing of AM/FM radio, as opposed to the digitally formatted content found in the Sirius XM accused products. [redacted]

Notwithstanding the foregoing, CAWT is now claiming that processing digitally formatted content, such as satellite signals, is within the scope of its '608 Patent. Ex. 16 [Quackenbush Opening Report at ¶¶ 96, 137-38, 160-61, 196, 232, 237-38, 260-61]. Given these allegations and the disclosure continued in the defective specification, the '608 Patent does not demonstrate to a person of ordinary skill in the art that the inventors possessed the full scope of the invention now claimed by CAWT. No reasonable jury could decide otherwise. The '608 Patent is therefore invalid as a matter of law for failing to meet the written description requirement of Section 112 because there is no description of digitally formatted content being processed through the "signal acquisition stage" or the "channel extractor."

B. The '608 Patent is Invalid Under 35 U.S.C. § 112 for Lack of Enablement.

As the *en banc* Federal Circuit has noted, "written description and enablement often rise and fall together." *Ariad*, 598 F.3d at 1352. Such is the case here. Given the defective specification, it is undisputable that the '608 Patent does not "enable one of ordinary skill in the art to practice the claimed invention without undue experimentation." *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1355 (Fed. Cir. 2012) (quoting *Nat'l Recovery Techs., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1196 (Fed. Cir. 1999)).

As noted above, CAWT's proposed broad interpretation of the asserted claims would have the claims cover the processing of digitally formatted content using multi-carrier modulation. Putting aside the fact that this was the very technology that CAWT gave up in the prosecution of the '608 Patent Application and attempted to capture with the Continuation Application (which was ultimately abandoned), there is nothing in the defective specification that would permit a skilled artisan to practice an invention involving processing digitally formatted content. For these reasons, the '608 Patent is not enabled because it fails to teach one of skill in the art how to make and use a system that processes digitally formatted content through a "signal acquisition stage" or "channel extractor."

C. The '608 Patent is Invalid Under 35 U.S.C. §§ 102 and 103 Based on CAWT's Interpretation of the '608 Patent Claims.

There are no genuine disputes of material fact regarding the three prior art references cited in

this motion. This case is ripe for summary judgment. *Leggett & Platt, Inc. v. VUTEk, Inc.*, 537 F.3d 1349, 1352, 1356 (Fed. Cir. 2008)(deciding anticipation on summary judgment). CAWT's application of the claims to the accused products, primarily relying on the plain and ordinary meaning of the claim limitations, render the '608 Patent invalid. CAWT's application of the claims is so broad that any type of transmission is covered, including digitally formatted content.[5]

CAWT's expert, Dr. Quakenbush has taken the following positions:

- "The MCM signal…is a wide-band signal." Ex. 25 [Reply Expert Report of Dr. Schuyler Quackenbush ("Quackenbush Reply Report") at ¶ 17;
- A Time-Division Multiplex ("TDM") bit stream[6] is a "plurality of individual channels." *Id.* at ¶ 18 ("the term 'individual channel' refers to a representation of broadcast audio programing, irrespective of the form or format of the signal that carries the information. It could be carried by a radio frequency signal during transmission but could also be carried by a digital bitstream as it is processed within the receiving device.");
- "The file management system consists of the system controller and the associated software." Ex. 16 [Quackenbush Opening Report at ¶ 109]);
- Any structure between the signal acquisition stage and a Fast Fourier Transform ("FFT")[7] is a "channel extractor input interface" *Id.* at ¶ 130 ("channel extractor input interface is the structure in the device that selects the time domain samples from the high-bandwidth digital data stream received from the ADC");
- "The FFT is the processing block." *Id.* at ¶ 136;
- FFT necessarily requires an input buffer. Ex. 25 [Quackenbush Reply Report at ¶ 59] ("the FFTs in the STA875 cannot function without an input buffer.");
- FFT necessarily requires an output buffer. *Id.* at ¶ 61 ("The FFTs in the accused devices cannot function with the output buffers.").

Based on these positions, Claim 1 (which is representative of all asserted claims) reads as follows:

1. A system for wide-band reception and processing of signals comprising:

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[5] Sirius XM disputes CAWT's proposed constructions. For example, the '608 Patent and prosecution explicitly state that "digital data is not processed." *See, e.g.*, Ex. 1 ['608 Patent, Figure 2, col. 8, ll. 31-64]. Nonetheless, for the limited purpose of this motion, Sirius XM is utilizing CAWT's construction to demonstrate invalidity.

[6] The TDM bit stream is a digital data stream of all of the content broadcast on the Sirius XM system.

[7] A Fast Fourier Transform is an operation that transforms samples from the time-domain to the frequency domain. For the purposes of this case, it is synonymous with a Fourier Transform and a Discrete Fourier Transform. Cox Decl., ¶ 8.

> a signal acquisition stage for receiving a **[MCM signal]** comprised of **[TDM bit stream]**;
>
> a channel extractor for extracting the **[TDM bit stream]** from the **[MCM signal]**, coupled to the signal acquisition stage;
>
> a **[system controller]** for managing the **[TDM bit stream]**, coupled to the channel extractor; and,
>
> storage coupled to the **[system controller]**, whereby at least one **[portion of the TDM bit stream]** is stored for later use,
>
> wherein the channel extractor further includes:
>
> a **[structure between the signal acquisition stage and an FFT]** for selecting a plurality of time domain samples from the high-bandwidth digital data stream;
>
> a **[FFT]** for converting the plurality of time domain samples into a plurality of frequency domain samples, coupled to the channel extractor input interface; and,
>
> a channel assembler, for assembling the plurality of frequency domain samples into a **[TDM bit stream]**, coupled to the processing block.

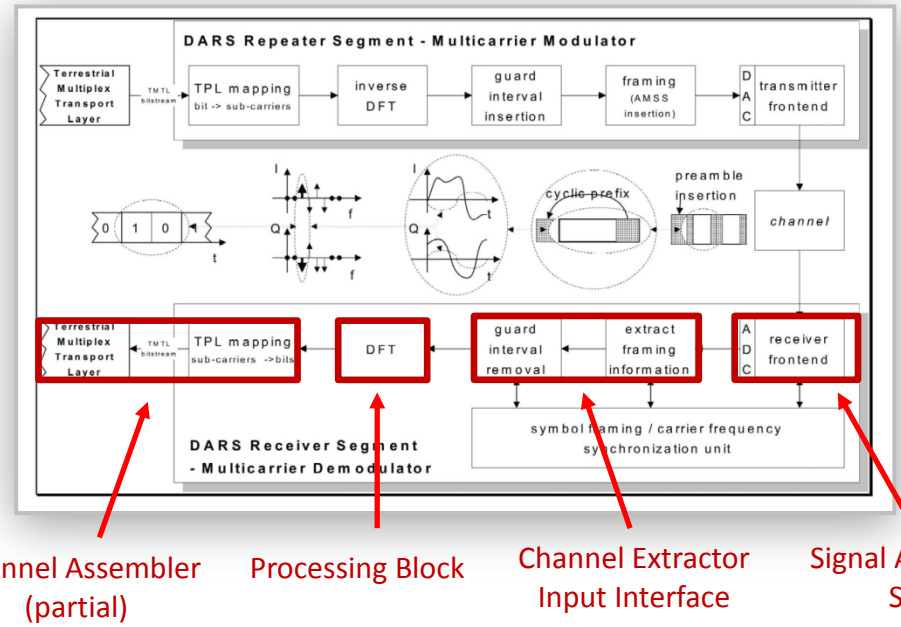
As set forth below, under CAWT's interpretation, the asserted claims necessarily read on Sirius XM's '656 Patent and '003 Patent, as Sirius XM's patents cover the accused products. In addition, the '760 Publication anticipates the '608 Patent because it discloses every limitation of the asserted claims.

1. CAWT does not contest that the prior art teaches several elements of the '608 Patent.

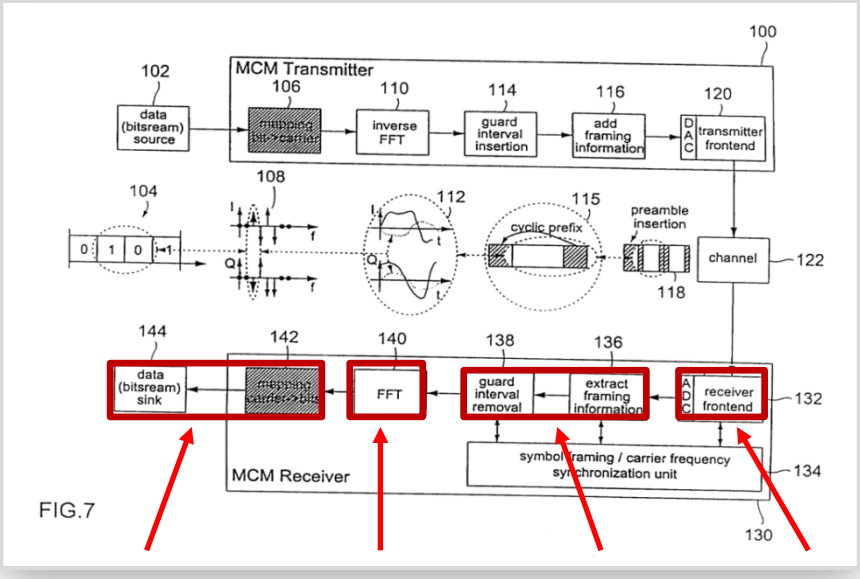
CAWT does not dispute that the prior art teaches many elements of the '608 Patent. The reason is simple. Sirius XM's broadcast system, launched in September 2001, existed long before the filing date of the '608 Patent. Cox Decl., ¶ 4. In addition, there have been no changes to the Sirius XM broadcast technology since its inception because Sirius XM must be able to broadcast to all of its legacy products. *Id*. If Sirius XM were to change its broadcast technology, all previously sold products would be rendered useless because they would not be able to receive and process the signals. *Id*. As a result, CAWT's infringement proofs are based on technology that predates the '608 Patent.

Below is an example of CAWT accusing old technology of infringement. In his expert report, Dr. Quackenbush asserts that a number of claim limitations are met based on a diagram of an MCM receiver (reproduced below) which is from Sirius XM's technical documentation dated 5 years before

the filing date of the '608 Patent:



As shown above, Dr. Quackenbush asserts that the signal acquisition stage, channel extractor input interface, processing block and a portion of the channel assembler are covered in this figure. This figure is nearly identical to Figure 7 of Fraunhofer's '664 Publication,[8] a Sirius XM contractor who helped develop the accused products.



Ex. 18 ['664 Pub., Fig. 7].

[8] The '664 Publication was identified as prior art in Sirius XM's invalidity contentions and Dr. Cox, Sirius XM's expert on invalidity, used it as a separate basis for invalidity.

A cursory comparison of the '664 Publication to Sirius XM's technical documentation demonstrates that the '664 Publication teaches the signal acquisition stage, channel extractor input interface, processing block, and channel assembler elements of CAWT's infringement assertions. It is for this reason that CAWT does not dispute that (1) the prior art teaches these elements,[9] (2) that the MCM demodulator depicted above is well known to one of skill in the art, and (3) that a signal acquisition stage, channel extractor input interface, processing block and channel assembler are inherently disclosed in any prior art reference that mentions MCM. Cox Decl., Ex. A.

2. The three prior art references cited herein disclose the processing of digitally formatted content.

The '656 Patent and '003 Patent are two of many Sirius XM patents that cover its broadcast and receiver technology, the systems underlying CAWT's allegations of infringement. Ex. 3 [Wadin Depo. at 266:6-274:15]. Sirius XM owns a substantial number of patents covering this technology. The company's two predecessors − Sirius Satellite Radio Inc. ("Sirius") and XM Radio Inc. ("XM") − were fierce competitors in a race to launch their satellite radio system in the 1998-2001 timeframe. As such, both companies had teams of engineers focused on the development of new products and aggressively sought IP to protect their ideas.

During this time, XM filed the '656 Patent and '003 Patent based on similar, but distinct, ideas. The '656 Patent was filed because the XM engineers recognized that users would appreciate the ability to play and store broadcasts on their personal devices. As a result, the '656 Patent focused on receiving satellite and terrestrial signals and storing individual songs on portable devices. Ex. 19 ['656 Patent, col. 1, ll. 11-15]. The '003 Patent focused on enabling passengers on aircraft to access the broadcasts during flight. As such, the '003 Patent discloses storing the entire TDM bit stream that is

[9] In addition to the "signal acquisition stage" limitation of claim 1 and certain sub-elements of the "channel extractor" of claims 1 and 6, including the "channel extractor input interface," "processing block" and portions of the "channel assembler," CAWT also does not dispute that the prior art discloses the limitations of dependent claims 3 and 8. [Quackenbush Reply Report at ¶¶ 88, 89, 112, 113] Furthermore, CAWT does not dispute that the '003 Patent discloses the "storage" limitation of claims 1 and 6. Cox Decl., ¶ 63.

broadcast to devices. Ex. 20 [‘003 Patent, Abstract]. Both of these technologies invalidate the ‘608 Patent based on CAWT’s infringement allegations.

In addition, the ‘760 Publication describes a receiver for receiving and storing data from a Digital Audio Broadcasting (“DAB”) signal, which uses the same techniques as MCM. Cox Decl., ¶ 57. The DAB standard is primarily used for digital transmission in Europe and Asia, whereas satellite radio technology in the United States uses MCM for terrestrial broadcasts. The ‘760 Publication describes a system that mirrors the elements of the asserted claims of the ‘608 Patent. In particular, the ‘760 Publication discloses receiving a DAB signal containing up to 50 separate digital audio programs, extracting the digital audio content for two separate programs simultaneously, and storing digital audio data in memory for later playback. Ex. 21 [‘760 Publication, Abstract]. As explained more fully in the subsections below, these prior art references invalidate the asserted claims.

a. The ‘656 and ‘003 Patents anticipate, or in the alternative, render Claims 1 and 6 obvious.

Sirius XM’s ‘656 Patent and ‘003 Patent[10] each anticipate the asserted claims of the ‘608 Patent under CAWT’s application of the claim language because they disclose the same system accused of infringement. While the reasons for invalidity are summarized below, detailed claim charts proving the ‘656 Patent and ‘003 Patent invalidate the ‘608 Patent are attached as Ex. A to the Cox Decl.

i. The ‘656 and ‘003 Patents disclose the signal acquisition stage limitation of Claim 1.

Based on its infringement positions, CAWT asserts that the signal acquisition stage limitation reads as follows:

> a signal acquisition stage for receiving a **[MCM signal]** comprised of a **[TDM bit stream]**

CAWT does not dispute that the prior art reads on this limitation. In any case, the ‘656 Patent discloses this element because it discloses receiving a signal that has been “reformatted to Multi-

[10] The ‘003 Patent incorporates the following patents by reference: U.S. Patent Nos. 7,123,875; 6,823,169; 6,229,824; 6,510,317; and 6,154,452, by reference. CAWT does not dispute that these patents are incorporated by reference.

Carrier Modulation (MCM) and rebroadcast by terrestrial repeaters." Ex. 19 ['656 Patent, col. 2, ll. 55-67]. Further, the '656 Patent discloses that the MCM rebroadcast contains an "RF carrier [that] supports up to 50 channels of music or data in Time Division Multiplex (TDM) format." *Id*. Thus, the '656 Patent discloses a signal acquisition stage that receives an MCM signal comprised of a TDM bit stream.

Similarly, the '003 Patent discloses the signal acquisition limitation. The '003 Patent describes receiving signals from terrestrial repeaters that "repeat satellite signals from one of the satellites in geographic areas where [line of sight] reception is obscured" and that for terrestrial broadcasting, "MCM is a preferred modulation scheme." Ex. 20 ['003 Patent, col. 1, ll. 54-57]; Ex. 22 ['875 Patent, col. 4, l. 5]; s*ee also id.* ['875 Patent, Fig. 5]. The transmitted signal includes "a composite data stream [that] comprises a plurality of program channels" where "the composite data stream 66 is a time division multiplexed (TDM) ensemble." Ex. 20 ['003 Patent, Abstract, col. 6, ll. 6-11]. As such, the '003 Patent also discloses a signal acquisition stage.

ii. The '656 and '003 Patents disclose the channel extractor limitation explicitly, inherently, or in combination with the '644 Publication.

Based on its infringement positions, CAWT asserts that the channel extractor limitation found in Claims 1 and 6 reads as follows:

> a channel extractor for extracting the **[TDM bit stream]** from the **[MCM signal]**, coupled to the signal acquisition stage; . . .
>
> a **[structure between the signal acquisition state and an FFT]** for selecting a plurality of time domain samples from the high-bandwidth digital data stream;
>
> a **[FFT]** for converting the plurality of time domain samples into a plurality of frequency domain samples, coupled to the channel extractor input interface; and,
>
> a channel [stream] assembler, for assembling the plurality of frequency domain samples into a **[TDM bit stream]**, coupled to the processing block.

Notably, CAWT does not distinguish between the channel extractor in Claim 1 and the channel extractor in Claim 6. Therefore, all of the arguments with respect to the channel extractor claim element in Claim 1 equally apply to Claim 6.

The '656 Patent and '003 Patent disclose the channel extractor because the references teach that a TDM bit stream is extracted from the MCM signal using an FFT. And as set forth above, CAWT does not challenge many of the components of the channel extractor, including the "channel extractor input interface," "processing block," and at least a portion of the "channel assembler," because these are necessary components of an MCM system and Sirius XM has been using this technology for over 13 years. Cox Decl., ¶¶ 63, 4.

With respect to the '656 Patent, the reference discloses that "a digitally encoded bit stream is received over-the-air" and "selectively decod[ed]" from the MCM signal. Ex. 19 ['656 Patent, Col. 4, ll. 44-49]. Similarly, the '003 Patent discloses that the receiver isolates the MCM signal so it is "ready for demodulation (signal extraction) by demodulators 317, 318, and 319," and extracts a "composite data stream representing a plurality of broadcast channels in a time division multiplex format for later playback." Ex. 23 ['169 Patent, col. 7, ll. 35-36]; Ex. 20 ['003 Patent, Col. 2, ll. 58-60]; s*ee also id.* ['003 Patent, Fig. 7]. Because the TDM bit stream is extracted from an MCM signal, the '656 Patent and '003 Patent teach that a structure between the signal acquiring stage and the FFT is used to select and convert time domain samples. Cox Decl., ¶¶ 22, 44, 53. Further, by virtue of the MCM process, these references teach that an FFT converts the time domain samples into frequency domain samples. *Id.* Finally, because the references state that a TDM bit stream is extracted from an MCM signal, they teach that the frequency domain samples are assembled into a TDM bit stream. Cox Decl., ¶ 40. For these reasons, the '656 Patent and '003 Patent disclose the "channel extractor" limitations of the '608 Patent, as CAWT applies the element for infringement purposes.

Furthermore, at a minimum, a person of ordinary skill in the art would know the required processing steps for an MCM system, and that such system reads on the channel extractor limitation. Sirius XM and CAWT agreed that a person of ordinary skill in the art would have a bachelor's degree in Electrical Engineering and five or more years of practical experience in general digital signal processing and digital communications systems. Ex. 16 [Quackenbush Opening Report at ¶ 21]. Dr. Quakenbush admits that this person of ordinary skill would have knowledge of MCM systems, including the fact that MCM systems require a Fast Fourier Transform for sampling time domain

samples and converting them to frequency domain samples in order to recover the transmitted stream of data. Ex. 24 [Quackenbush Rebuttal Report at ¶ 40]. Thus, there is no dispute that the '656 Patent and '003 Patent teach the channel extractor limitation because they both disclose the processing of an MCM signal to extract a TDM bit stream.

To eliminate any doubt, the '664 Publication teaches the understanding of one of skill in the art with regard to MCM systems. As demonstrated above, Figure 7 depicts a typical MCM receiver. The MCM receiver acquires an MCM signal at the signal acquisition stage (132). The MCM signal is then subject to frame extraction (136) and guard removal (138). Then a plurality of time domain samples are fed into the FFT (140). The FFT converts the time domain samples into frequency domain samples. Finally, the MCM receiver maps and assembles the frequency domain samples (142) into bit stream (144).

To the extent CAWT contradicts Dr. Quakenbush and argues that one of skill in the art would not know the details of an MCM system, it would be obvious to combine the '656 Patent or the '003 Patent with the '664 Publication because all of the references explicitly discuss the processing of MCM signals and one would combine these references like pieces of a puzzle in order to create an MCM receiver. Cox Decl., Ex. A.

iii. The '656 Patent and '003 Patent disclose the file management limitation of Claim 1 and the storage limitation of Claims 1 and 6.

Based on its infringement positions, CAWT asserts that the file management and storage limitations read as follows:

> a **[system controller]** for managing the **[TDM bit stream]**, coupled to the channel extractor; and,
>
> storage coupled to the **[system controller]**, whereby at least one **[portion of the TDM bit stream]** is stored for later use,

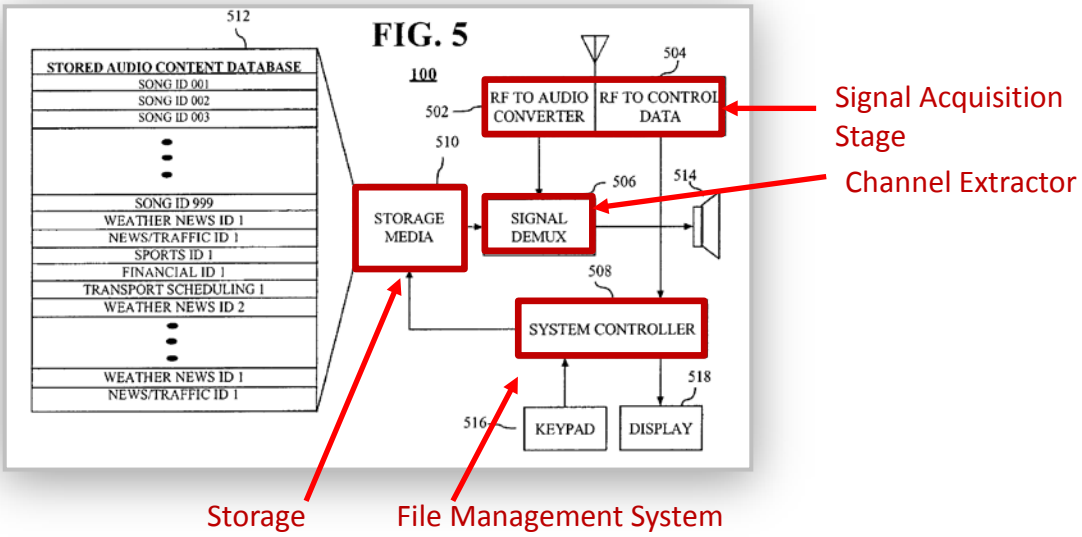
Notably, CAWT does not provide any meaningful differences between the storage limitations in Claim 1 and the storage limitations in Claim 6.[11] Therefore, all of the arguments with respect to Claim 1

[11] Dr. Quackenbush provides in his expert report that the storage in Claim 1 is coupled to the file management system while the storage in Claim 6 is coupled to the channel assembler. However, Dr. Quackenbush states that this is not a meaningful difference because the "storage is coupled to the

equally apply to Claim 6.

The '656 Patent and '003 Patent each disclose the file management system and storage limitations because they each disclose a system controller for managing the TDM bit stream and storing at least a portion of the TDM bit stream. The only difference between the references is that the '656 Patent stores portions of the bit stream, such as individual broadcasts, while the '003 Patent stores the entire TDM bit stream. However, these differences are immaterial because, according to CAWT, an "individual channel" can be "any representation of the audio signal." Ex. 16 [Quackenbush Opening Report at ¶ 72].

The '656 Patent discloses a system controller for managing the TDM bit stream and storage where a portion of the bit stream is stored. Figure 5 of the '656 Patent shows all of the claimed elements of the '608 Patent, including the signal acquisition stage (502, 504), channel extractor (506) the system controller (508) and the storage media (510) for storing a variety of songs, news, and other content:



With respect to the system controller, the '656 Patent discloses that the "system controller 508…control[s] a signal demultiplexer block 506 for selecting either real time content segments or locally stored content segments." Ex. 19 ['656 Patent, col. 4, ll. 20-26]. For storage, the '656 Patent

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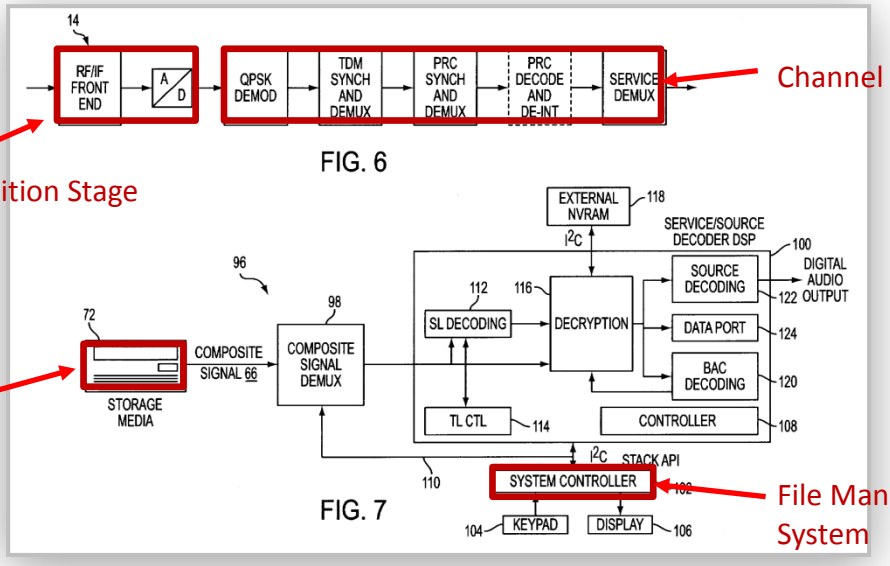
channel stream assembler through the system controller." Thus, Dr. Quackenbush has taken the position that as long as the components are connected to each other in some way, even though there may be intervening components, they are still coupled for purposes of the claims. Ex. 16 [Quackenbush Opening Expert Report at ¶ 227].

teaches that "local storage media 510 [has] multiple content segments [from the TDM bit stream] that have been tagged for storage by the user." *Id.* at col. 4, ll. 11-16. As such, the '656 Patent teaches the file management and storage limitations as CAWT interprets the '608 Patent.

The '003 Patent also discloses a system controller and storage. Figures 6 and 7 of the '003 Patent show all of the claims elements, including the signal acquisition stage (14), channel extractor, the system controller (102) and storage media (72) for storing the entire TDM bit stream:



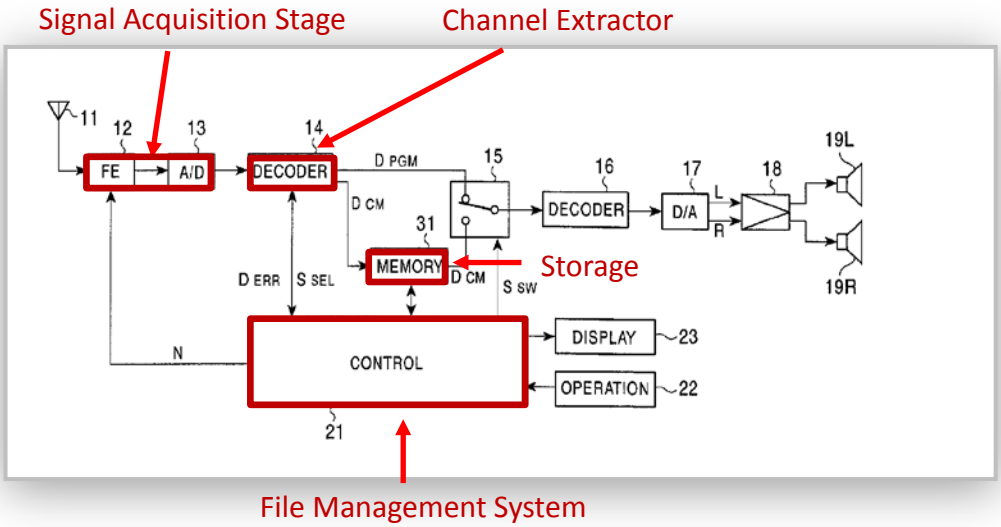
The specification of the '003 Patent teaches that the "system controller 102 can receive user inputs" and "guide users when making selections regarding which channels and programs to retrieve from the stored data stream for playback purposes." Ex. 20 ['003 Patent, col. 7, ll. 37-44]. With regard to storage, the '003 Patent discloses "record[ing] a composite data stream on a storage medium and play[ing] back selected content in the recorded composite data stream." *Id.* at col. 2, ll. 58-60. As such, the '656 Patent and '003 Patent disclose the "file management system" and "storage" limitations because they manage and store at least a portion of the TDM bit stream, either as separate digital audio content or as an aggregate TDM data stream, and allow the management of the digital audio content when it is stored in memory.

b. The '760 Publication anticipates Claims 1 and 6 of the '608 Patent.

Claims 1 and 6 of the '608 Patent are anticipated by the '760 Publication because it teaches a

DAB system, which Dr. Quackenbush admits discloses the same processing block as the '608 Patent, and meets all of the elements of the '608 Patent and asserted claims. Ex. 24 [Qackenbush Rebuttal Report at ¶ 40 ("[e]uropean systems for digital audio broadcast (DAB) use the same processing block (IFFT/FFT) as in the '608 patent.")]. The DAB system disclosed in the '760 Publication plays commercial content if the user selected content becomes interrupted. Ex. 21 ['760 Pub. at ¶¶ 32-36]. The system of the '760 Publication simultaneously extracts the user selected content and the commercial content from the DAB broadcast and routes the commercial content to storage. *Id.* at ¶ 32. If the user selected content ever becomes interrupted or the signal degrades, the system plays the stored commercial content. *Id.* at ¶¶ 33-36. This is precisely the same technology disclosed in the '608 Patent because it discloses the ability to extract multiple channels from a wide-band signal and store at least one of them. Ex. 25 [Quackenbush Rebuttal Report at ¶ 17].

A claim by claim comparison of the '760 Publication to the '608 Patent demonstrates that every claim element is met. Cox Decl., Ex. A. Figure 1 of the '760 Publication compared with the claim limitations is reproduced below:



As described in the specification of the '760 Publication, the receiver receives DAB signals containing up to 64 channels at the signal acquisition stage (12, 13). Ex. 21 ['760 Pub. at ¶¶ 0005-0006, 0010]. The channel extractor (14) simultaneously extracts a plurality of individual channels, namely digital audio data and commercial audio data, from a DAB signal using an FFT. *Id.* at Abstract, ¶¶ 15, 22, 32. The file management system (21) manages the plurality of individual channels

and routes at least the commercial audio data to storage (31). As such, the '760 Publication invalidates the asserted claims of the '608 Patent as explained more fully in the subsections below.

i. The '760 Publication discloses the signal acquisition stage limitation of Claim 1.

The '760 Publication discloses the signal acquisition stage limitation of the '608 Patent. This limitation is met because Figure 1 of the '760 Publication discloses an antenna 11 for receiving a DAB signal that is connected to a front-end circuit 12. Ex. 21 ['760 Pub., Figs. 1, 21; ¶ 32]. The DAB signal is further "supplied to an analog to digital (A/D) converter circuit 13 and is subjected to A/D conversion." *Id.* at ¶ 0022. As such, the '760 Publication discloses acquiring the DAB signal and creating a series of time domain samples through the use of the analog to digital converter circuit.

The received DAB signal is undisputedly a wide band signal that contains a plurality of channels. The '760 Publication discloses that the DAB signal has a transmission bandwidth of 1.5 MHz and is able to carry "[a] maximum of 64 channels of services … [e]ach service corresponds to, for example, one FM broadcasting station." *Id.* at ¶ 0010. Moreover, CAWT does not challenge that the '760 Publication teaches this limitation. *See generally* Ex. 16 [Quackenbush Rebuttal Report]. For these reasons, the '760 Publication discloses the "signal acquisition stage" limitation of claim 1 of the '608 Patent.

ii. The '760 Publication discloses the channel extractor limitation of Claims 1 and 6.

The '760 Publication also discloses a "channel extractor" limitation, including the sub-limitations of "channel extractor input interface," "processing block" and "channel assembler" of claims 1 and 6. Similar to the '656 and '003 Patents, CAWT does not dispute that the '760 Publication discloses the "channel extractor input interface" and "processing block" limitations because the elements are necessary for DAB systems and well-known to those skilled in the art. Ex. 24 [Quackenbush Rebuttal Report at ¶ 40].

The '760 Publication discloses the "channel extractor" limitation because the receiver extracts at least two different digital audio programs from a DAB signal containing up to 64 channels of digital audio content. Ex. 21 ['760 Pub., ¶ 0010]. The '760 Publication discloses that the receiver processes

the DAB signal for service and commercial digital audio programs, and that "[f]rom the decoder circuit 14, as described above, the digital audio data DPGM for the desired service and the commercial digital data DCM are extracted." *Id.* at ¶ 0028. Furthermore, the '760 Publication discloses that extraction of the service and commercial audio programs is performed simultaneously because "when a receiver is receiving a service in a satisfactory manner, a listener can listen to an arbitrary service … [a]t the same time, the commercial digital audio data DCM output from the decoder circuit 14 is sequentially stored in the memory circuit 31." *Id.* at ¶ 0032 (emphasis added). As such, a plurality of channels is extracted simultaneously from the DAB signal. Ex. 25 [Quackenbush Reply Report at ¶ 8].

The '760 Publication also undisputedly discloses the "channel extractor input interface" and "processing block" limitations because it discloses "[t]he digital signal is supplied to a decoder circuit 14 and is subjected to orthogonal demodulation [and] fast Fourier transform (FFT) demodulation." Ex. 21 ['760 Pub., ¶ 0024]. It is undisputed that FFT selects time domain samples and converts the selected time domain samples into frequency domain samples, further exemplifying the '760 Publication's invalidation of these claim limitations. *See* Ex. 16 [Quackenbush Opening Report at ¶¶ 129, 136].

Furthermore, the '760 Publication discloses the "channel assembler" limitation because the receiver assembles the result of the FFT to create service and commercial digital audio programs by performing a "differential quadrature phase shift keying (D-QPSK) demodulation, frequency de-interleaving, time de-interleaving, and error correction." Ex. 21 ['760 Pub., ¶ 0022]. The '760 Publication further creates a digital audio program "[i]n accordance with a selection signal SSEL, the decoder circuit 14 selects and outputs digital audio data DPGM for a desired service (program)." *Id.* These are the same processes that CAWT uses to show the accused products infringe the '608 Patent. Ex. 16 [Quackenbush Opening Report at ¶¶ 141-150, 241-250]. As such, the '760 Publication discloses the "channel assembler" limitation of the '608 Patent.

iii. The '760 Publication discloses the file management limitation of Claim 1 and the storage limitation of Claims 1 and 6.

The '760 Publication discloses the "file management system" limitation of claim 1 and

"storage" limitation of claims 1 and 6 of the '608 Patent because the '760 Publication discloses managing the extracted service and commercial digital audio content through a system controller, and that audio content is stored in memory. For example, the '760 Publication discloses the "file management system" limitation because the receiver has a "system controller 21 formed of a microcomputer" and the "system control circuit 21 supplies a service selection signal SSEL to the decoder circuit 14." Ex. 21 ['760 Pub., ¶ 0024]. Figure 1 also shows the Control 21 as coupled to the Decoder 14 and Memory 31. As such, the system control circuit manages the extraction and storage of a plurality of channels.

Furthermore, the "storage" limitation is met because the '760 Publication discloses that the system controller is coupled to a "memory circuit for storing the commercial audio data" and that the "commercial digital audio data DCM output from the decoder circuit 14 is sequentially stored in the memory." *Id.* at ¶¶ 0024, 0032 and Abstract. As such, the '760 Publication discloses the "file management system" of claim 1 and "storage" limitations of claims 1 and 6. As described above, the '760 Publication discloses every limitation of claims 1 and 6, and therefore anticipates these claims.

3. The '656 and '003 Patents, as well as the '760 Publication anticipate Claims 3 and 8 of the '608 Patent.

CAWT also asserts dependent claims 3 and 8 of the '608 Patent against Sirius XM. However, CAWT does not dispute that these claims do not add separate patentable subject matter distinct from the independent claims they depend from. *See, e.g.*, Ex. 24 [Quackenbush Rebuttal Report at 88, 89, 112 and 113]. Each claim respectively adds an input buffer, arithmetic engine and output buffer to the processing block of claims 1 and 6. CAWT agrees, however, that any system which uses an FFT, such as an MCM or DAB system, inherently requires the input buffer, arithmetic engine and output buffer recited in dependent claims 3 and 8. Ex. 25 [Quackenbush Reply Report at ¶¶ 59, 61]. As such, these claims are also invalidated by the '656 Patent, '003 Patent, and the '760 Publication.

IV. CONCLUSION

For the foregoing reasons, Sirius XM respectfully requests the Court grant summary judgment of invalidity.

Respectfully submitted,

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